RESPONSE AND REQUEST FOR RECONSIDERATION

Support.

Support for the ratio of 1.6 to 2.5 moles acid per 1 mole of aminoalcohol is found on page 4 at line 9.

Response.

Entry of this Amendment after final rejection, and consideration of this response, is requested because it is believed either to put the claims in condition for allowance or, alternatively, to simplify the issues for possible appeal.

The present invention relates to a fluid composition, particularly suitable for lubricating an automatic transmission or related devices (claims 12, 19) which contains a dispersant and a friction modifier which is the reaction product of a carboxylic acid and an amino alcohol. The components for the reaction product are selected such that the product contains aproximately two branched chain alkyl groups, each having at least about 6 carbon atoms. In order to provide two such alkyl groups, the acid (which typically will provide the branched chain alkyl group) and the aminoalcohol are reacted in a mole ratio of approximately 2:1, that is, 1.6~2.5:1. The reaction product of 2:1 is superior to the products of either 1:1 or 3:1 in terms of providing a combination of high static friction (μT) and a positive slope on the JASO M-348-95 test.

Compositions with the present benefits are not disclosed in the cited references. Koch, US 4,479,888, was cited as anticipatory of claims 1, 2, 4, 6, and 7. This reference discloses, in Examples 6 and 7, condensation products of isostearic acid with tris(hydroxymethyl)aminomethane or with 2-amino-2-methyl-1,3-propanediol, respectively. Similar products are disclosed in Examples 8-12. Notably, in all these cases the molar ratio of acid to the aminoalcohol is 1:1. The claims also stress that the amino alcohol is to be reacted "with an equimolar amount" of an acid. Thus, a condensation product is not formed by reaction in a mole ratio of 1.6~2.5:1 to provide predominantly 2 branched chains. Therefore, the present materials are novel over Koch.

Moreover, there is no teaching or suggestion that a Koch should make a product with a different molar ratio of reactants. Koch teaches that his products have the oxazoline structure as shown in Formula (I), column 2, and that this polar/basic function is important to effective performance in sludge prevention in a lubricant. (col. 1 line 27 through col. 2 line 14). Reaction in the approximately 2:1 molar ratio of the present claims would not be expected to provide Koch's oxazoline structure. Accordingly, it would not have been obvious to modify Koch's products or to arrive at the present invention by consideration of the teachings of Koch.

Certain of the claims were rejected as made obvious by Higaki (US 4,886,612) in view of Papay (US 5,652,201). Higaki discloses condensates of amino alcohols with various fatty acid such as isostearic acid. The ratio of trishydroxymethylaminomethane to stearic acid may be 1:2.8. The examiner had observed that, while Higaki does not disclose a dispersant, this is provided by Papay.

The present claims are now significantly further removed from the teachings of Higaki. The present claims require that the condensation product is made by reacting 1.6 to 2.5 moles acid with 1 mole of aminoalcohol. This is different from the ratio of 2.8 disclosed in Higaki. Sample A of Higaki is prepared using this ratio of 2.8, for instance, and the products is described, in Table 1, as having three groups, R_1, R_2, and R_3, all being isostearic acid alkyl residual groups. There is no reason, based upon Higaki, to select the presently claimed lower ratios of reactants.

In addition, the lubricating oils of Higaki are "metal plastic processing" lubricants, that is, they are designed principally for metal cold rolling, cutting, drawing, or pressing (col. 1 lines 10-13). There is only passing mention that they may be used for other applications such as spinning of synthetic fibers or as lubricating oils for internal combustion engines. That is, the lubricant is designed for applications involving the deformation or cutting of metals. This is quite different from the application of Papay, engine crankcase lubrication, where deformation or cutting of metals is plainly undesirable. It is equally remote from the application of the present invention, which involves lubrication of a transmission, tractor, gearbox, or bearing. All of these likewise use metals in a non-destructive manner, and all of their lubricants are exposed to a significantly different environment and have very different performance requirements, even than a crankcase lubricant. There is no reason to believe that a lubricant designed for metal distortion or cutting should be reasonably modified by selecting a different ratio of reactants for the major additive component and then combining it with an additive for an engine lubricant. There is no reason that such multiple steps should be undertaken with hopes of providing a material suitable for lubricating transmissions.

Moreover, as the examiner has noted, Higaki discloses his compounds for use as base lubricants and not as additives, although they may be blended with other oils. It should be borne in mind that the friction modifier (a) of the present invention is particularly employed to provide a high, stable coefficient of friction in a transmission fluid with a favorable ratio of static coefficient of friction:dynamic coefficient, as described in the present Examples section. There is no reason to expect that any such desirable results would be achieved by Hikagi's use of his different materials as a base oil composition (100%) or even at 30% or 10% levels as in his Table 6 or Table 11.

These levels are far outside the amounts set forth in, for example, claim 9 of the present invention (0.2 to 5%).

Accordingly, it is submitted that the present invention is not made obvious by a combination of Higaki with Papay.

Certain claims were also rejected as made obvious by a combination of Chung, US 5,244,590 in view of Higaki. Chung discloses a dispersant-viscosity index improver which can be used in, e.g., automatic transmission fluids, which may also contain friction modifier and dispersant. However, as has been discussed above, Higaki does not disclose the presently claimed materials and uses his lubricant for an entirely different purpose.

Claim 5 is also rejected as unpatentable over Higaki in view of Papay and further in view of Ichihashi (US 5,972,854), or alternatively Chung in view of Higaki and Ichihashi. Claim 5 specifies that the carboxylic acid component comprises a mixture of isostearic acid and octadecylsuccinic acid or –anhydride. As the examiner has noted, Chung and Higaki or Chung and Papay do not disclose an oxazoline compound derived from octadecylsuccinic acid. Ichihashi, however, does disclose reaction products of a carboxylic acid (which can be, among a list of some 22 acids, octadecylsuccinimic acid) and an amine (which may be any of a list of polyalkylenepolyamines or alkanolamines).

As has been discussed, above, there is no teaching in Higaki of condensation product made by reacting 1.6 to 2.5 moles acid with 1 mole of aminoalcohol. Nothing in Ichihashi remedies this defect. There is no teaching in Ichihashi of any reaction product in any ratios other than (presumably) 1:1. The material exemplified, for instance, is simple "Oleic Acid Diethanolamide." There is no particular motivation to select the particular combination of octadecyl succinic acid and an amino alcohol, select further the presence of isostearic acid along with the octadecylsuccinic acid, and finaly to select reaction ratios of 1.6~2.5 : 1 , as is required by the present claims. Accordingly, it is submitted that claim 5 is similarly not made obvious by the combinations of references.

Conclusion.

For the foregoing reasons it is submitted that the present claims are novel, unobvious, and in condition for allowance. The foregoing remarks are believed to be a full and complete response to the outstanding office action. Therefore an early and favorable reconsideration is respectfully requested. If the Examiner believes that only minor issues remain to be resolved, a telephone call to the Undersigned is suggested.

Any required fees or any deficiency or overpayment in fees should be charged or credited to deposit account 12-2275 (The Lubrizol Corporation).

Respectfully submitted,

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